DOCUMENT RESUME

ED 327 737 CE 057 133

AUTHOR Robertson-Smith, Mary
TITLE Articulation Models for Vocational Education. Information Series No. 343.
INSTITUTION ERIC Clearinghouse on Adult, Career, and Vocational Education, Columbus, Ohio.
SPONS AGENCY Office of Educational Research and Improvement (ED), Washington, DC.
PUB DATE 90
CONTRACT RI88062005
NOTE 42p.
AVAILABLE FROM Publications, Center on Education and Training for Employment, 1900 Kenny Road, Columbus, OH 43210-1090 (order no. IN343: $5.25).
PUB TYPE Information Analyses - ERIC Information Analysis Products (071)

EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS *Articulation (Education); *College School Cooperation; Community Colleges; Cooperative Education; Coordination; Credits; *Intercollegiate Cooperation; Postsecondary Education; *School Business Relationship; Secondary Education; Technical Education; *Transfer Policy; Two Year Colleges; *Vocational Education

ABSTRACT

Articulation, the coordination of curricula at different levels of education in order to improve efficiency and effectiveness, has become increasingly important in secondary and postsecondary vocational-technical education. Among the types of articulation being practiced are time-shortened models, advanced skills models, and tech-prep models. Program articulation can be between individual secondary and postsecondary institutions, among groups of schools in a consortium, between two-year and four-year colleges, or between educational institutions and nonschool agencies that have training needs. Administrative policies and procedures regarding admissions, advanced placement credit, assessment, and transfer also need to be articulated. Five types of school-to-school articulation models currently exist: (1) tech-prep programs, in which the last 2 years of secondary vocational training are articulated with the first 2 years of postsecondary education; (2) cooperative education; (3) proprietary schools; (4) retention of at-risk students; and (5) college-to-college articulation. Three forms of nonschool partnerships are business and industry arrangements with educational institutions for training for their workers; government agencies providing career development for public employees through colleges; and the awarding of credit for military training. Factors that inhibit successful articulation are institutional policies and procedures, negative attitudes and resistance, and poor communication. Successful arrangements can be achieved through local and state leadership, involvement of key personnel, consensus on goals and purpose, formal written agreements, and positive human relations. (56 references) (SK)

Information Series No. 343

ARTICULATION MODELS FOR VOCATIONAL EDUCATION

ED327737

Mary Robertson-Smith
Bergen Community College

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

☑ This document has been reproduced as received from the person or organization originating it.

☐ Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

ERIC Clearinghouse on Adult, Career, and Vocational Education
Center on Education and Training for Employment
The Ohio State University
1900 Kenny Road
Columbus, Ohio 43210-1090

1990

CE057133

FUNDING INFORMATION

Project Title:	ERIC Clearinghouse on Adult, Career, and Vocational Education
Contract Number:	RI88062005
Act under Which Administered:	41 USC 252 (15) and P.L. 92-318
Source of Contract:	Office of Educational Research and Improvement U.S. Department of Education Washington, DC 20208
Contractor:	Center on Education and Training for Employment The Ohio State University Columbus, Ohio 43210-1090
Executive Director:	Ray D. Ryan
Disclaimer:	This publication was prepared pursuant to a contract with the Office of Educational Research and Improvement, U.S. Department of Education. Contractors undertaking such projects under government sponsorship are encouraged to express freely their judgment in professional and technical matters. Points of view or opinions do not, therefore, necessarily represent official U.S. Department of Education position or policy.
Discrimination Prohibited:	Title VI of the Civil Rights Act of 1964 states: "No person in the United States shall, on the grounds of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving federal financial assistance." Title IX of the Education Amendments of 1971 states: "No person in the United States shall, on the basis of sex, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any education program or activity receiving federal financial assistance." The ERIC Clearinghouse project, like every program or activity receiving financial assistance from the U.S. Department of Education, must be operated in compliance with these laws.

TABLE OF CONTENTS

FOREWORD v

EXECUTIVE SUMMARY vii

OVERVIEW 1

- Types of Articulation 2
- Mechanics of Articulation 3
- History of Articulation 4
- The Need for Articulation Today 6

SCHOOL-TO-SCHOOL PARTNERSHIPS 9

- Tech-Prep Programs 9
- Cooperative Education Programs 12
- Articulation with Proprietary Schools 13
- Programs for Retention of At-Risk Students 14
- College-to-College Articulation 15

NONSCHOOL PARTNERSHIPS 21

- Business and Industry 21
- Government as Partner 25
- Military Education 26

SUMMARY 29

REFERENCES 31

FOREWORD

The Educational Resources Information Center Clearinghouse on Adult, Career, and Vocational Education (ERIC/ACVE) is 1 of 16 clearinghouses in a national information system that is funded by the Office of Educational Research and Improvement (OERI), U.S. Department of Education. This publication was developed to fulfill one of the functions of the clearinghouse--interpreting the literature in the ERIC database. It should be of interest to vocational education policy makers, administrators, and faculty at the secondary and postsecondary levels.

Mary Robertson-Smith, Vice President/Dean of Instruction at Bergen Community College, Paramus, New Jersey, prepared this paper for ERIC/ACVE. Dr. Robertson-Smith received a doctorate in education from Rutgers University, and she also has master's degrees in education and library science. She is the author of "Accreditation and Articulation of Business Programs," published in the special issue on enhancing articulation and transfer of *New Directions for Community Colleges*.

ERIC/ACVE also acknowledges the following people for their critical review of the manuscript: James P. Long, President, Cincinnati Technical College; John W. Walstrum, Chair, Technical Studies Division, Catonsville Community College; and Ray D. Ryan, Executive Director, CETE.

Publication development was coordinated by Susan Imel. Michael E. Wonacott provided assistance in revising the manuscript, which was edited by Sandra Kerka. Janet Ray served as word processor operator.

Ray D. Ryan
Executive Director
Center on Education and
Training for Employment

EXECUTIVE SUMMARY

Articulation is the process of coordinating curricula at different levels of education in order to improve efficiency and effectiveness. Financial restrictions, enrollment declines, and the need to foster excellence in technical and basic skills for the three out of four students who will not attain bachelors' degrees heighten the importance of articulation of secondary-postsecondary vocational-technical curricula.

Among the types of articulation being practiced are--

- **Time-shortened Models.** Students receive formal credit at their current educational level for course work completed at a previous level.

- **Advanced Skills Models.** The time saved by avoiding duplication of content is used to prepare students with more advanced occupational knowledge and skills, enabling them to enter employment at a higher level.

- **Tech-prep Models.** A specific focus on preparing students to accommodate technological change gives them the skills to enable continual, lifelong relearning.

Program articulation can be between individual secondary and postsecondary institutions, among groups of schools in a consortium, between 2-year and 4-year colleges, or between educational institutions and nonschool agencies that have training needs. Coordination of programs involves more than careful meshing of curricula. Administrative policies and procedures regarding admissions, advanced placement credit, assessment, and transfer also need to be articulated.

Although articulation has been practiced as early as the 1920s, many statewide policies and procedures came into being during the 1970s. By the 1990s, economic, technological, and demographic trends are inspiring renewed interest in articulation as a means of increasing program relevance, reducing the numbers of dropouts, preparing students for a lifetime of change, and contributing to economic development.

Five types of school-to-school articulation models currently exist:

1. **Tech-prep Programs.** In tech-prep, the last 2 years of secondary vocational training are articulated with the first 2 years of postsecondary education, leading to an associate degree. Virginia has been a leader in tech-prep curricula; its master technician in electronics and electromechanical technology program is a collaborative effort of local education agencies, the state department of education and community college system, and business, industry, and government.

2. **Cooperative Education.** Coordinated secondary and postsecondary cooperative placements give students real-world advanced occupational knowledge and skills and give employers more advanced and capable workers. Such programs foster closer collaboration between business and education, keeping programs up to date and maintaining a supply of employable program graduates.

3. **Proprietary Schools.** Admission of proprietary school graduates to advanced standing in 2- and 4-year public institutions is gaining in popularity.

4. **Retention of At-Risk Students.** Lowering the dropout rate through the motivation provided by career education is the focus of LaGuardia Community College's Middle College High School, in which potential dropouts can earn both high school and college credit.

5. **College-to-College Articulation.** In dual admission and joint degree programs, community colleges and 4-year institutions are coordinating course content, equipment, sequencing, and student services. Private colleges seeking to increase minority and disadvantaged enrollment are also developing articulation agreements.

Nonschool partnerships are arising in response to the need for a high-quality work force and the projected skills gap. Three forms of nonschool arrangements are as follows:

1. **Business and industry** arrange preemployment training curricula, industry-specific contract training, or recurrent education for their workers with educational institutions.

2. **Government agencies** provide career development for public employees through colleges; one example is continuing education for police, fire, and emergency medical personnel.

3. The awarding of credit for **military training** is being evaluated by a number of educational institutions.

Factors that inhibit successful articulation are institutional policies and procedures, negative attitudes and resistance of individuals responsible for implementing articulation agreements, and poor communication of information. Successful arrangements can be achieved through local and state leadership, involvement of key personnel, consensus on goals and purpose, formal written agreements, and positive human relations.

Information on articulation may be found in the ERIC system using the following descriptors: *Articulation (Education), *College School Cooperation, Community Colleges, Cooperative Education, Coordination, Credits, *Intercollegiate Cooperation, Postsecondary Education, *School Business Relationship, Secondary Education, Technical Education, *Transfer Policy, Two Year Colleges, *Vocational Education. Asterisks indicate descriptors that are particularly relevant.

OVERVIEW

In the broadest terms, articulation can be defined as the coordination of curricula at different levels of education in order to maximize both the effectiveness and the efficiency of the educational process. Such coordination of curricula, or articulation, can occur between the secondary and the postsecondary levels, for example. In terms of vocational-technical education, the occupational programs at comprehensive high schools, area vocational schools, and joint vocational schools can be closely and carefully aligned with related programs at 2-year technical colleges, junior colleges, community colleges, or proprietary schools; secondary occupational programs can even be coordinated with related occupational programs offered by 4-year colleges and universities.

Likewise, 2-year postsecondary occupational programs can be coordinated with related 4-year programs in colleges and universities. Articulation can even occur across multiple educational levels: secondary programs can be coordinated with 2-year postsecondary programs that are, in turn, coordinated with 4-year postsecondary programs.

How can articulation maximize educational effectiveness and efficiency? Close coordination of secondary and postsecondary program content, for example, helps ensure that secondary program graduates possess all prerequisite knowledge and skills for postsecondary program work. Postsecondary students can learn effectively because they possess all the background information and competencies on which postsecondary content builds. When students are prepared in this fashion, learning can genuinely occur. The final product of the entire continuum of secondary and postsecondary education is a program graduate who genuinely possesses all the knowledge and skills needed to enter the world of work.

Similarly, efficiency is enhanced in articulated programs because duplicated course content is eliminated. When secondary and postsecondary program content is coordinated, postsecondary providers know what content is covered in secondary programs and need not require students to take introductory courses that repeat material students have already covered in their secondary programs. Thus, students need not spend precious time and money learning the same things twice; postsecondary institutions need not devote precious fiscal and personnel resources to providing instruction that students do not need.

The logic of articulation across levels of education has particular application in the area of vocational-technical education. In the workplace, for which vocational-technical education specifically prepares students, individual jobs often cluster into well-defined and universally recognized career ladders. One such career ladder can be found in health occupations; the first rung on the career ladder is nurse's aide or medical assistant, followed by licensed practical nurse, registered nurse, bachelor of science in nursing, and master of science in nursing or nursing administration. Secondary health occupations programs typically prepare students for

jobs at the lower end of this ladder, whereas 2-year postsecondary programs may prepare students both at the lower end and in the middle and university or graduate school programs prepare students for those at the upper end.

Now, a postsecondary licensed practical nurse program would cover a great deal of content covered in a secondary medical assistant program; much of the occupational knowledge and skills needed for one occupation is also needed for the other. The postsecondary program as a whole should provide all such occupational knowledge and skills, because at least some program entrants will have had no previous education or training in the health occupations area. Other entrants, however, will have had such previous training and may indeed have worked as a medical assistant for some years. If the secondary medical assistant program and the postsecondary licensed practical nurse program are properly articulated, the postsecondary program operators know exactly what occupational knowledge and skills secondary program graduates possess and postsecondary courses covering such content can be waived for secondary program graduates. The result? The educational process is more efficient, because qualified secondary graduates are not required to repeat course content they already know, yet the process still remains effective because those graduates are genuinely prepared for the new content they will receive in their postsecondary program. The same logic applies to the progression from licensed practical nurse to registered nurse, from registered nurse to bachelor of science in nursing, and from bachelor of science to master of science in nursing.

Types of Articulation

In general, two different types of articulation are practiced, differing essentially in the specific results that they produce. Perhaps the most common type of articulation is the ***time-shortened*** model: students receive formal credit at their current educational level for program or course work successfully completed at a previous educational level and can consequently complete their current educational program sooner. To return to the previous example, a graduate of the secondary medical assistant program entering the postsecondary licensed practical nurse program would receive credits for his or her secondary program work that would apply toward graduation from the licensed practical nurse program. As a result, the secondary medical assistant program graduate would be able to complete the postsecondary licensed practical nurse program sooner and at a lower cost--and enter the world of work sooner--than a student with no previous health occupations training.

The second type of articulation is the ***advanced skills*** model. Advanced skills programs are, like time-shortened programs, carefully designed to avoid duplication of program content; however, advanced skills programs use the time saved to provide students with more advanced occupational knowledge and skills rather than to allow them to enter the world of work sooner. The hours of instruction represented by secondary program training for which students receive postsecondary program credit can be used to prepare students to begin employment at the level of advanced technician rather than at the level of beginning technician.

One powerful variation of the advanced skills model is the technical-preparatory, or ***tech-prep***, model. Like advanced skills programs, tech-prep programs devote the time saved by avoiding duplicated instruction to providing more advanced occupational knowledge and skills; however, tech-prep programs also add a component

specifically designed to prepare students to accommodate technological change in the workplace. The tech-prep model begins with the assumption that technology will continue to evolve in the future at least as fast as it has in recent years, if not even faster. From that assumption, it proceeds to the conclusion that today's students will be faced with the continual need to learn new occupational and technological knowledge and skills. Students are prepared for this continual relearning by a component of applied academic and technology skills that they can apply for the rest of their lives in learning new occupational technology. Thus the tech-prep model not only prepares students for immediate entry into the world of work but also prepares them to change with the technological times so that they can remain productively employed.

Mechanics of Articulation

Articulating secondary and postsecondary vocational-technical programs involves first and foremost careful and close coordination of individual program curricula. Such coordination is easiest when those curricula are competency based; well-written and well-researched occupational program competencies lend themselves to the kind of analysis and comparison needed to establish the equivalence of one body of course content to another. In some cases, determining which secondary courses are equivalent to which postsecondary courses and how much postsecondary credit students will receive for those secondary courses is as far as curriculum work goes. In other cases, however, new curriculum content may be added to existing content (for example, additional occupational knowledge and skills or applied academics and technology skills), an entire new curriculum might be defined (the addition of a new occupational program within a career cluster), or existing curriculum content may even be deleted (the elimination of a more advanced occupational program at the secondary level to make room for an applied academics and technology core).

However, curriculum is not the only component of vocational-technical programs to receive attention during the process of articulation. Administrative policies and procedures may be needed to allow advanced placement credit for secondary course work and to establish exactly how much credit is to be granted for what course work. Course materials may need to be revised in light of changes in course content. Policies, procedures, and even instruments may be needed to evaluate entering students' current state of occupational knowledge and skills. Formal, written agreements are typically generated between the institutions involved and also between the individual departments or programs in each of those institutions. Finally, the provision of student services such as counseling, admissions, and financial aid may require modification so that students can be appropriately counseled and admitted into articulated programs and financial assistance provided as available and needed.

The extent of program articulation can vary a great deal. At one extreme, one vocational-technical program at one secondary school can be articulated with one related program at a postsecondary institution. In a more comprehensive arrangement, a single secondary school can articulate its entire range of vocational-technical programs with appropriate programs at a postsecondary institution. Likewise, groups of secondary and postsecondary institutions can form a consortium, with one or more specific programs articulated between all participating secondary and postsecondary partners. Such group efforts are often seen on a regional basis, with all the secondary and postsecondary

institutions in a county or metropolitan area joining efforts to establish regionwide articulated programs. Finally, individual institutions can establish articulated programs with other appropriate institutions that are some distance away but that typically serve the program graduates of the first institution; for example, a community college might articulate its programs with the 4-year state university that many of its graduates go on to attend.

Furthermore, program articulation need not be confined to educational institutions. Articulation partnerships have been developed between educational institutions and many noneducational agencies that have specific training or education needs. Such partnerships may provide preemployment training or articulated contract courses for business and industry. In addition, government agencies--including police and fire academies, emergency medical technician training agencies, and other municipal, county, and state training agencies--have developed effective and significant partnerships through articulation of curricula and services. Responding to the new technologies of computer-based instruction, interactive video, and videodiscs, government has turned to partnerships with colleges rather than duplicate resources. The vast educational and training system of the military services has developed partnerships with postsecondary vocational-technical systems to assist in military credit articulation.

History of Articulation

Given the common-sense appeal of articulation and its intended benefits of improved effectiveness and efficiency, it is no surprise that articulation is not a new concept. As early as the 1920s, a 6-4-4 system was established in southern California, with grades 11-14 housed in the newly founded Pasadena Junior College, later to become Pasadena City College (Whitlock 1978). The seventh yearbook of the National Education Association, published in 1929, was completely devoted to a discussion of articulation among educational institutions at all levels; in 1947, "the need to provide easier transition between high school and college" was underscored in the report of the President's Commission on Higher Education (Opachinch and Linksz 1974, p. 1).

Articulated academic programs and credit received national attention in the 1950s with the Advanced Placement (AP) Program and the College Level Examination Program (CLEP). The AP program aimed at allowing secondary students to take college-level foundation courses while still in high school; they received advanced standing once they matriculated to a postsecondary institution. CLEP examinations were intended to permit students or adults to "test out of" beginning-level courses at postsecondary institutions (Long et al. 1986).

Articulation efforts began to lag behind need in the 1960s. With large numbers of community and technical colleges being established across the nation, equally large numbers of students were faced with the need to transfer into senior colleges or universities--with the hope of keeping their existing credits intact. Unfortunately, few systematic attempts at planning and collaboration were occurring between 2-year and 4-year postsecondary institutions, leaving students to negotiate largely as individuals with senior colleges and universities replete with policies, procedures, and functionaries. In the area of secondary-postsecondary articulation, New York was achieving initial success in its first efforts to articulate selected business and technical programs among high schools and 2-year colleges (Brick 1967).

During the 1970s, a number of states began to establish statewide policies and procedures for articulation. Notable among these were Florida and Illinois, in which formal agreements and plans were developed in credit transfer. Those plans were followed by Georgia's Core Curriculum Formula and by the New Jersey Full Faith and Credit Policy of 1973. Massachusetts established the Commonwealth Transfer Compact in 1974, Nevada adopted the University System Articulation Policy in 1974, and Oklahoma developed its Articulation Plan in 1975. By the middle of the decade, these seven states had developed statewide programs for credit transfer and articulation.

Also by the middle of the decade, joint activities had been undertaken by quite a few secondary and postsecondary institutions to articulate their occupational programs. Indeed, interest and activities in articulation had reached such a level that several national studies of articulation were undertaken. Following a survey of state advisory councils, the National Advisory Council on Vocational Education (1976) reported that almost 40 percent of the states responding to their survey had planned articulation in place between secondary and postsecondary levels of education. Examining a number of articulated occupational programs, Bushnell (1978) reported that many educators viewed program articulation as nothing more than enlightened self-interest. Further, he concluded that state encouragement or even mandates for articulation were not necessarily sufficient for success, but that the best results were achieved when institutions cooperated voluntarily because each one saw that it stood to benefit.

By 1990, 10 states had transfer agreements affecting all of higher education, and 30 of the 50 states had some credit transfer policies in place for the major segments of postsecondary education. In the remaining 20 states, numerous individual agreements are in force between or among individual institutions or segments of higher education. Kintzer (1989) identified four types of state initiatives in articulation and credit transfer:

1. **Legal mandates in state legislation or constitutions.** In most cases, completion of an associate degree is the basic qualification for transfer to a senior institution. In addition, legislation usually specifies articulation services and presents general education requirements for the degrees given by state institutions. Colorado, Florida, Georgia, Illinois, Nevada, New Jersey, Rhode Island, Texas, and Washington have such legal mandates.

2. **System policies.** Often resulting from state master planning recommendations, system policies typically focus on transfer student services, with responsibility placed in a commission or an office of the system. States in this category include Arizona, Connecticut, Iowa, Kansas, Kentucky, Louisiana, Montana, Nebraska, New York, North Carolina, Oklahoma, Pennsylvania, Utah, Virginia, West Virginia, and Wyoming.

3. **Voluntary interinstitutional or intersegmental agreements.** Innovative activities in support of articulation are occurring in many states. Voluntary agreements occur perhaps most frequently in states that do not have large numbers of transfer applicants, minimizing the demand for articulation within those states. States notable for voluntary agreements include Alabama, Alaska, Arkansas, California, Hawaii, Idaho, Michigan, Mississippi, New Hampshire, New Mexico, North Dakota, South Dakota, Tennessee, Vermont, and Wisconsin.

4. **Articulation agreements primarily involving vocational-technical education.** Kintzer identified Delaware, Indiana, Maine, Ohio, Oregon, and South Carolina as having agreements primarily involving vocational-technical education. He noted that the 2-year public colleges in Indiana, Maine, and South Carolina are technical institutes and that some postsecondary vocational-technical education providers in Delaware, Ohio, and Oregon have academic articulation agreements with universities in the state.

The Need for Articulation Today

At the dawn of the 1990s, the need for the improved effectiveness and efficiency of education that program articulation can provide is more critical than ever. Economic and technological trends are affecting the nature of the workplace and of the tasks performed in it. Demographic trends are altering the nature of the work force. Calls for educational reform from many quarters of society are spotlighting the quality of education in the United States. Many see the articulation of the continuum of occupational programs that comprise vocational-technical education as one of the key means of improving the effectiveness and efficiency--that is, the quality--of education in the nation.

Economic and Technological Trends

The most casual exposure to the evening television news brings the knowledge that the national economy is in a state of transition. The goods-producing sectors of the economy, the staple of national economic growth for a century, are in a period of relative decline, while the service-producing sectors of the economy are experiencing great growth. More and more, today's workers need and tomorrow's workers will need a different set of occupational skills--skills in the areas of communication, decision making, and problem solving. Many analysts predict that the service jobs of the information age will in fact call for a higher level of worker skills in many areas than the industrial work force has traditionally possessed.

In addition, technology has an enormous impact on the nature of the workplace, the nature of the tasks performed by workers, and the nature of the occupational knowledge and skills that workers need. More and more workers in all sectors of the economy are faced with rapid and almost continuous changes in the technology that they use on the job; in all likelihood, the pace of technological change will increase rather than diminish as time goes on. Workers today need a much higher level of knowledge and skill in communication, computation, science, and technology than those of yesterday to master the new technology of the workplace. Further, they will continue to need and use those higher levels of knowledge and skills to keep abreast of the continuing and perhaps even faster change in workplace technology that will occur in the future. Gone are the days when a young person can receive training in an occupation that will last him or her a lifetime; instead, workers face a future in which they must continually relearn the tasks and technologies of their jobs as those technologies evolve and advance.

Demographic Trends

Statistics illustrating changes in the demography of U.S. education and the work force are commonplace today. No longer is education a process completed upon graduation from high school at age 18 or college at age 22. Rather, people can now expect to return to education more

than once in their adult working lives. Many return to formal education after spending time in the work force; witness the increase in the average age of students in 2-year and 4-year colleges and universities across the nation. One phenomenon that is new but more and more common in recent years is the *stopout*--the young person who completes secondary education, works for several years, and returns to further training in a postsecondary institution that will allow progress up a chosen career ladder. Equally, the number of mature adults seeking retraining because of economic dislocation or a desire for a career change grows yearly.

Likewise, the nature of the U.S. work force and, hence, of those seeking training to enter or reenter that work force, is changing. An increasing proportion of both new entrants to the work force and enrollees in vocational-technical education programs is disadvantaged, either educationally or economically. The needs of such disadvantaged workers and students are different from those of traditional workers and students. Disadvantaged persons may, for example, have an imperative need to stop out of education--to earn an income to support themselves and their families as beginning technicians in their occupational areas and to return later for continued training to advance in their occupations. Or, they may have a particular need for fundamental knowledge and skills in communication, computation, science, and technology that will enable them to master both the current and the future technology of the workplace.

Educational Reform

Educational reform has become an important item on the national agenda. Standardized test results from U.S. schools show poorly in comparison to those of other nations' schools. U.S. students drop out of secondary education in alarming numbers. Problems of drugs and discipline in schools are the subject of glaring headlines and news reports. Many taxpayers are coming to feel that the reform of the educational system cannot be bought by increased tax levies but that a fundamental rethinking is needed to improve the effectiveness and efficiency of the schools and make them competitive once again in the world arena.

Articulation as One Solution

Program articulation can be a powerful tool in addressing many of the issues just raised. A carefully planned and executed continuum of vocational-technical programs in occupational career clusters can provide the students and workers of both today and tomorrow with opportunities for effective and efficient education. The increased relevance of vocational-technical programs can help to keep many potential dropouts in secondary education, while preparing them for productive and satisfying employment in the workplace. The provision of a core of applied academic and technological knowledge and skills can prepare all students to cope with a lifetime of change in the technology of the workplace. Easily accessible, logically sequenced postsecondary programs can prepare students to enter the world of work as advanced technicians--both students who enter immediately from high school and students who return to education after a significant time in the workplace. The built-in possibility of stopping out of education can offer benefits to many disadvantaged persons, allowing them to meet both their educational and their personal needs in the order of their own priorities. The elimination of unnecessary duplication of program content can allow secondary and postsecondary institutions to realize increased efficiencies in an age of tighter budgets.

Program articulation is not, of course, a panacea. It cannot address the fundamental causes of economic change; it will not arrest technological change; it does not mean an end to the educational and economic disadvantages that many students experience; it does not treat all the elements of education in need of reform. It can, however, provide vocational-technical education and training of immediate and lasting benefit to the students of today and the workers of tomorrow.

SCHOOL-TO-SCHOOL PARTNERSHIPS

It is informative to examine actual collaborative partnerships in existence to plan and implement articulated vocational-technical programs. In this chapter, attention focuses on tech-prep programs, programs involving cooperative education, programs involving proprietary schools, programs in which a principal aim is retention of students otherwise at risk of dropping out, and college-to-college articulation.

Tech-Prep Programs

It is easy to visualize the perfect articulation partnership between, for example, a secondary vocational-technical school and a community college. Such model designs abound in the literature; as one example, Dale Parnell's (1985) landmark book *The Neglected Majority* offers many tech-prep models articulating 2 years of secondary vocational-technical training with 2 years of postsecondary training leading to an associate degree (referred to as "2+2" programs). The perfect articulation partnership could be visualized as follows.

Students enroll in a secondary technical or vocational-technical school. They are counseled about the tech-prep program and given a complete 3- or 4-year outline of exactly what is required, what postsecondary institutions have which programs available, what financial aid packages are offered, and what grade point averages are needed to maintain good standing in the secondary and postsecondary programs. Students are taken on tours of the facilities of the postsecondary institutions, and they make their decisions with their parents. Once students are enrolled, they attend periodic sessions at the appropriate postsecondary institution to establish mentorship relationships with students who have preceded them in the articulated tech-prep program and to get acquainted with their faculty academic program advisors. When students graduate from the secondary vocational-technical school, they are automatically admitted to the postsecondary institution, where they receive additional counseling, although they already feel at home in the college setting.

Leadership teams for the tech-prep program are cochaired by respected faculty members from each partnership institution--one secondary and one postsecondary. Secondary and postsecondary faculty confer frequently on the tech-prep program, covering such items as equipment purchase and upgrading, the use of computer software, textbook changes, and the purchase of teaching materials. Assessment charts and competency checklists are included in each student's portfolio. Postsecondary faculty members are frequently asked to participate in the evaluation of secondary vocational students, and secondary vocational members are asked just as frequently to assist in the evaluation of postsecondary students' program and occupational skills. In this way, open communication can be maintained at all levels of the program on students' progress and on any problems that might arise. Written articulation agreements are in place, and courses at the secondary vocational-technical school are clearly equated with courses at the postsecondary institution, so

that both faculties are involved in and committed to making curriculum competencies equivalent as well. Postsecondary faculty members see the overall tech-prep program as an asset to their individual occupational programs and as a means of filling their upper-level courses with qualified students; secondary faculty members see the tech-prep program as a means of helping their students move into the work force either at a more rapid pace or at a more advanced level. Both sets of faculty enjoy the partnership activities with their colleagues at the partnership institution. Each faculty has access to the unique technical and equipment resources of both partnership institutions.

State department of education officials have assigned a high priority to the tech-prep programs. Grant monies have been dedicated to fostering innovative programs in the area, and both faculties have been asked to present workshops and write articles for newspapers circulating throughout the state. Employers are eager to hire graduates of the tech-prep program, in part because employers have participated extensively in advisory committees and helped define the state of the art of the program. In addition, employers have also seen tech-prep program students at work in cooperative education placements.

This ideal program is based on a study carried out by the National Center for Research in Vocational Education (McKinney et al. 1988) analyzing and identifying the factors influencing success in tech-prep articulation efforts. As can be inferred from the description of the perfect program, some of the key issues identified were program improvement, increased services to students, the assignment of a high priority to articulation by state officials and local administrators, open communication channels, effective interpersonal relationships, and well-planned and well-written articulation agreements.

Tech-Prep in the States

The state of Virginia saw the implementation of one of the first tech-prep curricula ever designed: the master technician in electronics and electromechanical technology program in the Virginia peninsula, a collaborative effort of local education agencies, the state department of education, the state community college system, business, industry, and government. The partners included high schools from several local counties, the New Horizons Technical Center, Thomas Nelson Community College, Bendix Corporation, Kentrol International, Modern Machine and Tool, the National Aeronautics and Space Administration (NASA), Newport News Shipbuilding, Phillip Morris-York Engineering, Pressure Systems, Inc., Teledyne Hastings-Raydist, Virginia Power, and Wyle Laboratories. The articulated curriculum, combining the 2 final years of high school and 2 years of community college for an associate in applied science degree in electronics and electromechanical technology, was installed in Hampton, Virginia, in 1983.

Forty supervisors from business and industry came together to define the skills that they believed entry-level workers in electronics and electromechanical technology should have. A core of common skills was identified and embedded in a single, 4-year continuum of program offerings bridging the last 2 years of high school and the first 2 years of college. Taken as a whole, the tech-prep curriculum comprised a program for master technicians in electronics and electromechanical technology to meet the labor force needs of a job market that included naval shipyards, research centers, and NASA.

A key issue is raised in *Articulation in Virginia: Coordination of Secondary/ Postsecondary Education* (Virginia Department of Education 1988): "The concept of multiple partnerships is also essential to the 2+2 plan. 2+2 requires collaboration between education and business, industry, and government; vocational and academic education; secondary and postsecondary education; and field experts and instructional personnel. Ideally, a 2+2 program involves the entire occupational community it serves" (p. 6).

Three tech-prep 2+2 models were developed in Virginia, including the master electronics and electromechanical technician program and an information processing specialist program. What have been the success factors in Virginia's development of these articulation programs? The first principle indicated (ibid.) was that development was systematic. With state funding, a project director and a steering committee were appointed to plan, implement, and evaluate the program. In addition, an advisory committee of business, industry, and government personnel was formed to work with the program. Occupational surveys were conducted for the specific occupational areas defined by the project; these surveys were compared to occupational forecasts validated by representatives of business, industry, and government. Curricula were developed by project writing teams that included both faculty members and expert practitioners in the field; curricula were then validated by the advisory groups. The resulting materials were published and widely disseminated. The program was implemented and thoroughly evaluated with an eye to possible modifications and improvements.

In addition to the Virginia model for master technician in electronics and electromechanical technology, Michigan is funding 10 model 2+2 projects. California, New York, Ohio, and North Carolina have also initiated tech-prep model programs. Prominent among the programs are those in nursing, drafting and design, automotive technology, and automated manufacturing.

Of particular note are the articulation arrangements between Sacramento City College (California) and the Sacramento City Unified School District. This arrangement features an articulation council, which was formed to address perceived problems of underprepared students, duplication of effort, and diminishing budgetary resources. Curricula, textbooks, equipment, and course content for an Academy of Math, Science, and Engineering were planned by joint articulation councils. Facilities are also shared among partnership institutions: for example, state-of-the-art computer-aided drafting equipment at Hiram Johnson High School has been made available for advanced City College course work.

Research on Tech-Prep

Researchers report various findings and recommendations about tech-prep as a form of articulation. Boyer (1983) recommended that elective clusters be developed for the last 2 years of high school to prepare students for the eventualities of both college and work. In addition, he recommended that colleges form comprehensive partnerships with secondary schools. Day (1985) reported several popular techniques used by colleges for achieving articulation. Two-thirds of the colleges that Day surveyed reported implementing credit courses for local high school students. In addition, 30 percent reported advanced placement programs; 29 percent, articulation of specific courses with secondary schools; 13 percent, joint faculties shared with secondary schools;

and 11 percent, facilities shared with local secondary schools.

Parnell (1985) focused on the elements of balance, connectedness, and continuity in 2+2 programs. The target population for the 2+2 programs that Parnell addressed was the middle quartile of students in the United States--the group that he named the neglected majority. Parnell made the point that advanced placement courses, for example, had created a time-shortened college experience for students in general education and that this time-shortened experience had been widely accepted by the academic world. In vocational-technical education, however, there was no equivalent to advanced placement courses, except in those relatively rare instances in which progressive institutions had implemented articulated 2+2, 2+1, or 1+2 programs. The premise on which such articulated programs had been based was that just as secondary students in English and history could learn advanced subject matter and earn advanced placement credit for college, so could secondary students in vocational-technical education learn advanced occupational knowledge and skills and earn advanced placement credit for college.

Cooperative Education Programs

Another articulation model is that of the cooperative education partnership, involving collaboration among secondary institutions, postsecondary institutions, and business and industry. In such partnership programs, students gain early access to cooperative education experiences; indeed, their secondary cooperative work experience is a prerequisite for advanced cooperative work experience at the postsecondary level. Furthermore, because students have had previous cooperative work experience at the secondary level, they can be placed in more challenging cooperative education placements at the postsecondary level--their secondary experience prepares them for a potentially more productive postsecondary experience. The more productive postsecondary experience not only provides an opportunity for students to acquire advanced occupational knowledge and skills; cooperative education employers also receive more advanced and capable workers.

Day (1985) identified eight critical problems that could inhibit cooperative education articulation efforts. Because of declining enrollments, issues of turf were cited as the most prevalent problem, with many institutions acting to protect their own perceived interests. In addition, scheduling problems were noted, including conflicting calendars and course offerings. Union contracts for faculty sometimes interfered with the establishment of cooperative education articulation, since the differences in workload between secondary and postsecondary faculty required careful and precise analysis. Other problems centered on attitudes held by staff (for example, a sense of competition, the fear of loss of budget, the perception of the one institution and its staff by staff of the other institution) and the communication difficulties that could ensue.

Boyer (1983) made an excellent analysis of such inhibiting factors: "Time and time again, when people think about collaboration they focus first on budgets and bureaucracy, on the costs involved, on hiring one or two directors, on renting space, on paper clips and new letterhead" (p. 267). Boyer made the point that such attitudes were self-defeating and were frequently a smoke screen hiding essential unwillingness to act. Boyer recommended that resources, although important, should not become a preoccupation for secondary and postsecondary planners: the most successful programs were those in which

people saw a need and found the time to act, with little red tape or extra funding.

Analyzing their experiences at Dundalk Community College, Harsher and Day (1987) identified several keys to successful collaboration in cooperative education articulation:

- Goal consonance, or the consistency of goals and expectations between the two institutions
- Administrative commitment, or the extent to which the program receives strong support from top administrators
- Early faculty and counselor participation, beginning with the initial planning stages
- A clearly defined and stated purpose, so that the goals of articulation are known to all participants
- A formalized agreement with simplified procedures for implementation
- Human resource factors, including mutual trust and confidence, open communication, and recognition of contributions

One of the most valuable benefits of articulation programs involving cooperative education is that the two partnership institutions can offer a longer-term cooperative education placement to business and industry because of the continuity of students in the program as a whole. A reservation expressed by many people in business and industry about postsecondary cooperative education is that it does not allow for the career development of the cooperative education student, since the typical postsecondary cooperative placement is only one term. With an articulated cooperative education program, however, students can be placed in a 1-year cooperative experience at the secondary level and return to the same company for a more advanced and challenging cooperative experience at the postsecondary level. In many high-technology areas (such as computer-aided design), the longer total cooperative experience can allow students a wide range of challenging opportunities in the workplace. Similarly, the greater length of the total cooperative experience also allows employers increased opportunity to evaluate students' occupational knowledge and skills, with the result that many more students are hired by their cooperative education employers after the articulated cooperative placement.

Articulation with Proprietary Schools

In addition to articulation programs being developed and implemented between public secondary and postsecondary educational institutions, there have also been significant developments in program articulation between public educational institutions and proprietary schools throughout the nation. Proprietary schools are institutions at either the secondary or postsecondary level that provide occupational programs (Lerner 1987); they may be publicly or privately held. Parnell (1985) estimated that there are some 6,000 proprietary schools through the United States.

Since proprietary institutions exist for profit, government agencies and the educational community have traditionally been skeptical about entering into articulation agreements on behalf of nonprofit schools and colleges. Such reservations notwithstanding, three types of program articulation exist between public education and proprietary schools (Lerner 1987). The first, 2+2 programs in which secondary vocational program graduates enter the proprietary school at an advanced level, is

still not common today. The second, collaborative articulation arrangements between two or more proprietary schools, is also relatively rare--perhaps understandably so, in view of the relative competitiveness of these for-profit institutions. The third, however, is gaining in popularity: the admission of proprietary school graduates to advanced standing in 2-year or 4-year public education institutions.

For example, advanced admission standing is available for graduates of New Jersey's Berkeley Schools, which have been accredited by the Middle States Regional Accreditation Commission on Higher Education. Berkeley's programs in the word processing and secretarial areas, for instance, are based on clearly delineated competencies that have been correlated with community college program competencies in similar career fields. Berkeley's graduates can benefit from articulation agreements by entering cooperating community colleges and 4-year colleges with advanced standing.

Other prominent examples of articulation arrangements for transfer credit from proprietary school to public postsecondary institution include the following:

- Tampa College and United Electronics, a private trade school, have an articulation agreement whereby the college accepts 112 quarter credit hours and from one-half to three-quarters of courses taken at United.

- Commonwealth College, a proprietary school in Norfolk, Virginia, has developed articulation agreements with Strayer College, a private nonprofit college, for advanced standing admission into Strayer for Commonwealth's graduates.

- Two Ohio institutions--Urbana College, a private nonprofit college, and Bliss College, a proprietary business school--have developed articulation agreements.

- The Rochester Institute of Technology in Rochester, New York, and the Ohio Institute of Photography in Dayton have developed an agreement whereby students can complete a baccalaureate degree in 2 years plus 2 summers.

Another leader in this arena is Cuyahoga Community College (CCC) in Cleveland, Ohio, which has developed articulation agreements for transfer credit with seven proprietary schools in the county. Students who complete a 1-year diploma receive 45 quarter credit hours toward CCC's associate of technical study degree. This program is also unique in that CCC students who wish to enroll in occupational programs not offered at the college may take appropriate technical courses at the proprietary schools and their general education courses at CCC (Long et al. 1986). Such sharing of resources and development of joint 1+1 degrees is remarkable.

Programs for Retention of At-Risk Students

The issue of retention was analyzed by Miller and Imel (1987). One of their four issues was the possible contribution of career and vocational education in the reduction of the dropout rate. Their review of research indicated that--

> career education increases basic skills achievements, particularly in the application and long-term retention of skills. Students with low motivation to attend school have shown improvement in school attendance and retention after participating in career education experiences. Vocational students who

> have participated in career education are more likely to complete the vocational program they have selected. Finally, career education has consistently demonstrated effectiveness in increasing students' career planning skills. Thus, students are better able to set personal, educational, and occupational goals that lend meaning and motivation to the high school experience. (p. 13)

Many futurists and demographers predict the continuation and even growth of a permanent underclass in the United States, with dropouts from education becoming a disproportionate drain on the economic resources of the nation. If current U.S. Department of Labor projections (White 1988) to the year 1995 are correct, a significant number of the fastest-growing occupations will require a 2-year associate degree, whereas only two will require a 4-year baccalaureate degree. With the technological revolution, the skill levels required for jobs have increased dramatically; at the same time shortages of skilled workers are projected. Assuming all these projections to be accurate, the need for better vocational-technical program articulation to assist in lowering the dropout rate becomes imperative.

One model program designed with the purpose of retaining students who are at risk of dropping out is the articulated curriculum implemented by LaGuardia Community College and Middle College High School (Lieberman 1986). This high school/college retention program has been operating for 10 years with a focus on at-risk students. Currently, a total of 450 Middle College High School (MCHS) students attend classes and laboratory sessions at LaGuardia Community College, earning both high school and college credit in this highly innovative program.

The LaGuardia program allows students to use all of the college's facilities; LaGuardia student IDs provide MCHS students access to all of the college's labs and studios. With the program's joint faculty concept, MCHS teachers become adjunct faculty at LaGuardia and college faculty members participate as teachers at the high school. The Middle College High School accepts only potential dropouts, yet this innovative program has helped the high school achieve a retention rate of 85 percent, compared to a retention rate of 60 percent systemwide--and a national dropout rate of 27 percent in 1986. This high school in a college setting seems, therefore, to have produced some significant retention results.

College-to-College Articulation

Perhaps the most common form of articulation between colleges is an arrangement for transfer credit, whereby the course credits of 2-year college graduates are transferred to a 4-year college when the graduate enters, assuring him or her advanced standing. Community colleges, for example, have had a commitment to transfer credit arrangements since their very origins; such arrangements in fact form a large part of the rationale for community colleges. Most community colleges establish degrees specifically designated transfer degrees. All in all, the transfer mechanism can work quite successfully, although problems have been experienced at times: transfer students are not always well-prepared for transfer, and the number of students entering 2-year colleges with the intention of transferring is frequently greater than the number of those who actually transfer.

According to Medsker (1960), two-thirds of the students entering community colleges in the 1950s intended to transfer to

4-year institutions; by the 1970s and early 1980s, the number of intended transfers had dropped to one-third. In the 1960s, approximately one-third of 2-year students actually transferred; by the 1980s, the proportion had fallen below 15 percent. However, de los Santos (1989) has pointed out that many community college students reflect the phenomenon of reverse transfer or already possess college degrees. Of the 60,000 students in Maricopa County Community College, for example, 7,000 were formerly enrolled in Arizona State University, while at the same time, 8,700 Arizona State University students had formerly been enrolled in Maricopa County Community College (LeBlanc 1987).

Cohen (1989) pointed out that the assessment movement has helped community colleges monitor student progress and enforce course prerequisites. He also noted that special fund set-asides for transfer have become prominent: California has set aside $3 million for transfer centers in 20 colleges; New Jersey has targeted special challenge grant funds for the recruitment of transfer-oriented minority students; Ohio awards funds for special activities to promote transfer; and Illinois has developed numerous special programs for both minority students and transfer students.

Cohen also called for the following major changes if community colleges are to reach parity in the proportion of students receiving the baccalaureate degree:

- Statewide agreements guaranteeing community-college associate-degree graduates admission to state universities with no loss of credit
- Special funding allocations for community colleges that increase their transfer rates
- A centralized database in each state to monitor progress
- Common course numbering systems so that student transcripts need not each receive a separate review

Other major recent publications chronicling the progress of college-to-college articulation include Bender (1990), Donovan, Schaier-Peleg, and Forer (1987), Kintzer (1989), Pincus and Archer (1989), and Prager (1988). Among these, Prager noted that students who transfer move from one institutional culture to another and that this culture change requires intellectual, social, and cultural preparation for students. Some of the model programs highlighted include the dual admissions program in Pennsylvania (Woodbury 1988), in which a pluralistic, decentralized system of colleges has fostered dual admission programs featuring both degree integrity and treatment parity for the community college student. The enhancement of benefits, bonding, and retention were examined, and additional programs in allied health transfer, engineering technology transfer, and urban minority student transfer were also discussed.

One example of transfer credit articulation is presented by the New Jersey Institute of Technology (NJIT) model (Thomas 1988). In this model, a computer-integrated manufacturing (CIM) degree was designed by NJIT with articulation agreements and joint degree programs with a number of community colleges in two regional consortia, one in the northern and one in the southern part of the state. Each consortium began an extensive program of curriculum development, including plans to use a new NJIT "factory of the future"; plans were also developed for equipment purchases at both the 2-year and 4-year institutions, so that equipment resources would be compatible throughout the entire program.

Community college faculty would have access to the factory of the future, which would feature robotics and automated guided vehicles, to teach project and design courses at the associate-degree level. NJIT would provide appropriate instructors for CIM-related courses in community-college curricula if the community college did not have faculty with the necessary specialization. Representing a continuum of educational offerings in a field in which the sequence of learning is critical, the model illustrates an important point: successful articulation programs typically involve teams of faculty from both (or all) participating institutions working on such areas as course content, equipment, sequence and prerequisites for learning, and student services.

Another growing trend appears to be the expression by prestigious private colleges and universities of interest in articulation arrangements with community colleges. Partly in response to the call for increased access for minority and disadvantaged students and partly in response to the social commitment of leaders and administrators themselves, programs have recently been established by New York University and Georgetown University for community college student articulation. The New York University program has developed a series of articulation agreements, each of which indicates the exact number of courses and credits, the exact program that the student must complete, and the number of courses and credit to complete for the baccalaureate degree. The Georgetown University arrangement is more informal, with individual referees from the community college student body for various curricula.

In the allied health area, there have been many significant articulation programs, including several throughout the nation based on a career-ladder approach from the level of licensed practical nurse to that of associate-degree registered nurse and bachelor of science in nursing. These programs, operating under specialized accreditation guidelines, have established a single competency-based continuum of both knowledge and skills, using several models for cognitive, affective, and psychomotor learning. Programs typically include competency testing as the student enters the program, using such tests as the American College Test-Proficiency Examination Program (ACT-PEP), to determine the credits to be awarded for the license practical nurse credential. In addition, many programs feature individualized learning programs, so that the typically adult learners in the area can progress at an accelerated pace.

Several national foundations have also expressed interest in the articulation and transfer function of community colleges and have offered grant programs to strengthen model programs or establish and test innovative practices. The Ford Foundation, for example, has established the Urban Community College Transfer Opportunities Program, with funds for 24 projects focused on minority student transfer. Proceeding on the assumption that minority students need additional support services in order to accommodate the cultural change involved in institutional transfer, the programs have developed special counseling, advisement, curriculum and course tutoring, and other articulation arrangements for minority community college students who seek to transfer to senior institutions.

The American Council on Education has also launched a grant program targeted at community colleges with large minority-student populations; grants focus on both articulation efforts and overall program excellence. Likewise, the Mellon Foundation has begun assisting baccalaureate-level institutions in focusing upon student services as they receive transfer students, especially minority students. It seems

clear that more than one private foundation has chosen to focus its attention and influence on the articulation and transfer function in higher education.

Yet another factor bearing on college-to-college articulation is the accreditation movement, with numerous accreditation agencies establishing standards for the transfer of credits from junior to senior institutions. In some cases--for example, those of the National League for Nursing and the Accreditation Board for Engineering and Technology--standards for general education, clinical or laboratory practice, and occupational competencies have been of very high quality and appear to have enhanced the level of excellence of the articulated programs. Both of these accreditation agencies stipulate that the baccalaureate-level institution is responsible for the quality and competence of graduates.

In the business area, however, the American Assembly of Collegiate Schools of Business (AACSB) has been criticized for accreditation standards that appear to impede rather than help the smooth transfer of credit from 2-year to 4-year programs. As Robertson-Smith (1988) pointed out--

> complaints have centered on what seems to be a double standard. The AACSB guidelines permit several methods for validation of credit from the 2-year college, including proficiency examinations or successful passage of advanced courses taken at the senior institution. Under AACSB guidelines, validation tests that may be administered to 2-year students in junior standing are not required of 4-year native juniors. Transferees are often tested on work that they completed several semesters before. Moreover, standards do not seem to be comparable, since they prohibit transferees but not native juniors from receiving credits for lower-level courses taken at the four-year college if they do not pass their upper-level course work. (p. 58)

However, the major complaint seems to be that the AACSB position is not compatible with community college education (ibid.). Indeed, critics have noted the disparity between the stated goals of the AACSB's major committee, Equal Opportunity for Minorities, and the apparently unequal treatment accorded to 2-year college students, many of whom are minority students seeking to enter AACSB-accredited institutions from community college programs.

One asset for allied health articulation is competency-based instruction with a common format at each level, but two factors constitute barriers: professional elitism and resistance to change (King 1988). As noted previously, when faculty are committed to providing students with career mobility, articulation negotiations can proceed smoothly. However, when one set of faculty believe that their own level of preparation is superior to that of the other set of faculty (a factor that some call "professional ethnocentrism"), then articulation efforts may be difficult or even impossible. Perhaps the effect of these factors should be analyzed in business articulation with AACSB-accredited institutions.

King (1988) also noted that the state coordinating body was extremely helpful in accomplishing the process of articulation for Michigan colleges. As of 1988, the College of Health and Human Services at Eastern Michigan University was working to develop transfer agreements with eight community colleges; portions of the Kentucky model were adopted for implementation.

Finally, with all the opportunities for articulation and transfer in the nation's diverse and dynamic postsecondary sector, one central point should be emphasized. Many vocational career degrees previously thought to be terminal degrees are now counted among the fastest-growing career areas; they have become, in fact, the "other transfer degree" (Prager 1988). Prager recounted estimates that the number of associate-degree students who attempted to transfer to 4-year institutions may have been as high as 50 percent or more of all 2-year community college transferees since 1975. Unfortunately, specific research is handicapped by a lack of transfer information collected specifically for this group; in addition, many associate degree holders attempt to transfer after stopping out of education and working in their career area for a number of years.

Prager suggested that rather than bemoaning the vocationalization of the community college, educators need to improve their database in order to determine how effectively vocational-technical occupational curricula prepare students for transfer. In addition, efforts should be made to improve general education, and increased attention should be paid to conceptual and communication skills in occupational programs. Prager reasoned that by improving preparatory programs, especially in math and science, and by improving transfer services, community colleges can monitor each student's progress through the transfer experience. Finally, since students may transfer several years after graduation, services for graduates should be provided for several years after graduation, as is the case with the ongoing career placement services of some senior institutions.

NONSCHOOL PARTNERSHIPS

One of the primary driving forces behind articulation has been the need for a high-quality work force and the projected skills gap--that is, the gap between the current level of work force skills and the level needed for the high-technology workplace of the future. One expression of this driving force is the number of programs and partnerships that have been developed by business and industry, government, and the military services with secondary and postsecondary vocational-technical institutions.

Business and Industry

According to the U.S. Bureau of Labor Statistics (White 1988), these occupations are projected to be the fastest growing during the period 1986-2000:

- Paralegal personnel
- Medical assistants
- Physical therapists
- Physical and corrective therapy assistants and aides
- Podiatrists
- Computer systems analysts
- Electronic processing technicians
- Medical records technicians
- Computer programmers
- Radiologic technologists and technicians

To judge from the list, only one occupation--podiatrists--has not yet been included in the traditional 2-year postsecondary curriculum array. All the other occupations in the list represent long-established curriculum areas in many of the nation's 2-year postsecondary institutions.

Furthermore, Smith and Trist (1988) noted that Johnston and Packer (1987), authors of the well-known *Workforce 2000*, as well as many other witnesses in the 1987 Congressional hearing on Competitiveness and the Quality of the American Work Force (Joint Economic Committee 1988), cited a belief that overall skill requirements are increasing and that there is a critical mismatch between the skills of the present work force and those needed for the workplace of the future. Rising education needs were also mentioned by Johnston and Packer (1987): the median years of education required for new jobs will 13.5, compared to 12.8 required for current jobs.

It is little wonder, then, that interest in articulation has also arisen in business and industry. Articulation partnerships come in many forms--preemployment training, contract courses, literacy training, Program of Noncollegiate Sponsored Instruction (PONSI) evaluations, and experiential learning assessment--of which preemployment training and contract courses provide the most instructive examples.

Preemployment Training

Many employers such as the Public Service Electric and Gas Company of New Jersey have found that testing potential employees assists the company in selecting a high-quality work force. However, such testing also presents a dilemma: tests that have predictive validity and reliability, making them attractive to employers, have also been found to be obstacles to women and minorities entering the work force. One possible solution to the dilemma of preemployment testing has been to develop preemployment training, in which potential workers are assisted in mastering the mathematics and science involved in preemployment testing.

The preemployment training curriculum developed for the Public Service Electric and Gas Company has been pilot-tested in the company's own Human Services Division. The company is now seeking to place preemployment training programs within the community colleges of New Jersey. The entire program is an example of a company need, a company solution, and a partnership with public vocational-technical education to implement the company solution.

The benefit to the company of this type of articulated training program lies in joining forces with the 2-year postsecondary education sector for the development of a broad-based preemployment training that could meet the needs of many different companies. The benefit to postsecondary vocational-technical education providers is that students not only gain the knowledge and skills they need for preemployment testing but also begin a career ladder of remediation at the postsecondary institution, with the potential for taking additional courses in a specific occupational area.

Contract Courses

In many ways, such preemployment training is similar to contract courses for business and industry: as business and industry perceive a specific need for training, secondary and postsecondary vocational-technical education institutions design courses and programs to meet the need; such programs and courses are then often offered by contract arrangements with business and industry. Excellent examples of such contract training courses can be found in many areas; one of the best examples can be found in North Carolina, where, in the interest of economic development, a concerted effort has been made by vocational-technical education providers to design and offer programs to the specifications of the business sector.

The need for contract courses appears to be well-recognized across the nation. In one survey (Gollattscheck, McKenney, and Mahoney 1986), the 2-year colleges surveyed offered over 650 contract courses or programs to local businesses or industries, with a majority of courses offered off campus. A report on the future health and vitality of the county community colleges in New Jersey (Shenker et al. 1987) included specific recommendations on 2-year/4-year college articulation. By 1988, the North Carolina Department of Community Colleges had identified several types of articulated business and industry programs that could be established in the community colleges of the state. A report prepared for the state department of education of Michigan (Jacobs 1987) identified the state's community colleges as primary training providers in a number of areas, including programmable automation technologies. The report also stated the need for improved articulation relationships between education and business and industry and increase involvement of both business and labor.

Likewise, the state department of education in New York established a Regional Education Center for Economic Development in 1987, as called for in an earlier publication (New York State Education Department 1986). The center was specifically targeted to meet the training needs of female and minority entrepreneurs and to assist disabled and dislocated workers in starting their own small businesses. A 1987 report by the New Mexico Association of Community, Junior, and Technical Colleges also focused on the potential role of 2-year postsecondary institutions in economic development. In particular, the report highlighted program articulation between postsecondary institutions and Job Training Partnership Act (JTPA) agencies, state legislation providing postsecondary institutions with a 2 percent share of property tax revenues, and a plan for state-level promotion of 2-year institutions aimed at the general public.

By 1986, the National Center for Research in Vocational Education (NCRVE) had published a guide (Long et al. 1986) to assist secondary and postsecondary institutions in creating articulation linkages with business, industry, and labor and particularly in offering training programs in cooperation with business and industry. Methods were also detailed for developing customized training apprenticeship programs and cooperative education programs. Practical advice was provided on formulating a needs assessment for economic development and additional economic development activities were suggested. Other NCRVE guides focused on articulation for proprietary schools (Lerner 1987) and critical factors influencing the success of secondary-postsecondary articulation (McKinney et al. 1988).

Also in 1986, the Center for Regional Policy Study of the Northeast-Midwest Institute suggested that community colleges could play a more active role than previously in economic development (McNett 1986). It was also recommended that community colleges become early and active partners in articulating strategic planning to demonstrate their ability to develop, market, and implement economic development plans in concert with business and industry. Other topics addressed included entrepreneurship and technical training, small business assistance centers, foreign trade assistance, contract procurement, and applied research.

A study conducted on behalf of Miami Dade Community College in Florida (Richter and Wahl 1987) collected the opinions of an "expert jury" of business leaders on the importance of 31 college functions and on the question of whether or not those functions should be supported by tax funds. The study also analyzed the level of public support for economic development activities including conventional occupational programs, articulation and other linkages with unions and professional organizations, noncollege programs, state-sponsored programs, and international trade education.

A report by the Illinois Community College Board (1986) identified community college business centers in the state and articulation activities carried out under an economic development grant. Those activities included customized job training, entrepreneurship training and services, assistance to businesses in seeking federal contracts, employment training for job skills, small business incubation, and industry retention, expansion, and attraction efforts.

Deegan and Drisko (1985) summarized the current interest in articulation with nonschool partners: "One of the most significant developments in higher education over the past decade has been the increased linkages between colleges and other organizations and institutions" (p. 14).

Business and industry were the subject of a conference presentation (Kapfer 1988) featuring the economic development strategy of the Eastern Iowa Community College District. The strategy focused on expansion of the employment base, diversification, assistance in expanding the market shares of existing businesses, and entrepreneurship. An Iowa Industrial New Jobs Training Program provided businesses with screening and recruitment of potential employees, preemployment training, and on-the-job training. The district also used four other strategies: small business development centers, an international trade seminar and consulting service, a database of products and services to assist business in finding new markets, and a procurement assistance center to help small businesses obtain government contracts.

Deegan (1988) analyzed the ways in which community colleges managed contract training programs. He found, that nationwide, 43 percent of employee training is provided by technical and nonschool organizations rather than by in-house functions of business. Deegan also covered such topics as the delivery of contract training, centers for contract training, and advisory structures for business and industry programs.

A recent report from the Alabama Department of Postsecondary Education (1987) described the critical need for the Alabama college system to join with the business and industry community in the state to identify the training and labor force needs of business and industry, design programs to meet those needs, and reduce the time gap between technological innovation and application in Alabama's business and education sectors. One of six major recommended goals for the state's college system was "revitalizing Alabama's economy."

The National Entrepreneurship Education Consortium conference of 1987 (Ashmore 1988) focused on several aspects of the "Seeds of Economic Development." Reports were heard from partnerships for economic development in New York, Ohio, Oklahoma, and Minnesota. Also discussed were small business innovation opportunities and methods for developing those within community colleges.

The College Board (*College Board Review* 1989-90) recently indicated that it is joining with U.S. business as "an ally in rearming the American work force." A recent conference focused on new business-education alliances to help solve the work force crisis and improve the nation's competitive edge. Likewise, Apple Computer chairman John Sculley ranked education, along with drugs and the economy, as one of the top three issues on the national agenda (Perry 1989-90). Sculley was but one of a powerful new constituency of private industry executives working with the educational sector. A U.S. Department of Labor study (Carnevale, Gainer, and Meltzer 1990) focused such concerns by analyzing the training needs of many technical professions, including scientists, engineers, and technicians.

The report of the Commission on the Future of the North Carolina Community College System (MDC, Inc. 1988) suggested, as one of its most important recommendations, that the mission of community colleges should be modified to stress mastery of the academic and occupational requirements of the workplace as well as the technological needs of business an industry. The commission also recommended that every community college should work with employers to develop a program of recurrent education to keep the work force up to date and well educated and that such programs should become integral parts of any regional

economic development program. Other recommendations were as follows:

- Decision makers should use community colleges for economic development efforts.
- Regional clearinghouses should be established to identify workplace needs and educational resources available to meet them.
- Partnerships with employers should be integrated into existing community college programs.
- Those partnerships should be recognized as important components of the mission of the community college.

Parnell (1990) stated, as one of the 14 major points of his forecast, that "many regional state colleges and community colleges will break free of the traditional university model, developing a new model emphasizing their role as regional learning centers, technology transfer agencies, and regional economic development organizations" (p. 31). Parnell proposed a new kind of economic development paradigm, in which new partnerships are formed between public education, private employers, and labor groups, with each group participating in collaborative efforts. In this new paradigm, public and private economic development agencies join with secondary and postsecondary vocational-technical education institutions to provide community service, worker training and retraining, technology transfer, education for the technical work force, and professional development. Four-year colleges and universities, on the other hand, provide graduate education and the production of knowledge, as well as technology transfer, community service, and professional development. Each of the components is important and unique in the services it provides; together, all three components form a new economic development triangle.

Government as Partner

Although the area of government partnerships with public education is not extensively covered in the literature, there is ample evidence that such partnerships are of increasing interest. The impetus in many of the articulation relationships developed between government and education to date has been career development for government employees, with a secondary emphasis on achieving economy by sharing resources.

Perhaps one of the most common areas for articulation has been police, fire, and emergency medical technician training. Examples can be found throughout the country of partnerships and alliances for articulation, ranging from established program offerings at educational institutions to specialized training at police or fire academies and joint programs. Such articulation may represent the same progression into professionalism that the medical professions experienced in the past. The training of doctors and nurses once took place in hospitals and diploma schools but has since moved into colleges and universities; likewise, as the police, fire, and medical emergency communities require higher levels of education, training for those communities is more often to be found in a higher-level educational institution.

Prominent examples of the articulation of fire training programs into community colleges can be found in Jacksonville, Florida, and Harrisburg, Pennsylvania. At Bergen Community College in New Jersey, the vice president of the college serves as the current elected chair of the board of the fire academy; the college and the academy have cosponsored over 2,000

enrollments in inservice and computer training and are now considering the possibility of institutional merger.

Emergency training programs are not the only instances of articulation relationships between government and education. Recently, Salem Community College in New Jersey hosted a conference for urban, suburban, and rural businesses; cosponsors included the U.S. Small Business Administration, the Salem County Department of Economic Development, the Salem County Economic Development Committee, and the Rutgers Regional Small Business Development Center, among others. The focus of the conference was to develop an information marketplace for the public-private partnership, with representatives of government agencies and the private sector, government buyers, prime contractors, lenders, and other providers of business development assistance.

Middlesex County College has developed a Commission on Education, Employment, and the Economy to create partnerships into the year 2010. This blend of government, business, and education leaders has developed a strategic plan for the college for the next 20 years, with identified priorities for linkages and partnerships.

Warren County Community College has developed the Skylands Small Business Development Center to provide training and other resources to small businesses. Funded by the U.S. Small Business Administration, the center includes a Family Day Care Provider Program, which offers business assistance to individuals who provide child care in their homes.

Military Education

The U.S. military education system is the largest in the world, with a wide variety of military occupational specialties. With the aid of the American Council on Education (ACE) guides, many 2-year postsecondary institutions have effectively articulated courses and programs from the military sphere into their established program curricula. Published biennially, ACE's ***Guide to the Evaluation of Educational Experiences in the Armed Services*** is a standard reference for awarding academic credit for learning acquired in the armed services. It contains recommendations for formal courses, occupational specialties, and subject standardized tests. To help institutions use the ***Guide***, ACE (1990) has published the ***Handbook to the Guide to the Evaluation of Educational Experiences in the Armed Services***.

Some institutions have well-developed articulation procedures for granting credit for training received in the military. For example, the Thomas A. Edison State College in New Jersey, a college without walls, has developed specialized procedures for military education transfer credit, with computerized advisement plans for articulation of military education credit. Military education transfer and articulation are characterized by many of the same problems as tech-prep articulation, however, with some postsecondary institutions reporting that military education cannot be equated to college-level instruction.

Palmer (1989) studied the status of military education and training in existing articulation arrangements and concluded that most articulation policies are not designed to "assist military service personnel or other nontraditional students who do not follow a linear path through the state's higher education system" (p. 15). Successful articulation of military and postsecondary education depends on a number of factors including improved documentation and information about military education and training; institutional flexibility to award credit for

nontraditional learning; promotion of successful models, such as Servicemembers Opportunity Colleges (SOCs); and additional incentives to grant credit for military education and training (ibid.).

SUMMARY

A number of different types and kinds of articulation arrangements are described in this paper. These descriptions expand the definition of articulation beyond the traditional agreements between educational institutions to include those between educational institutions and business/industry, government, or the military. There are some common themes related to the development of articulation agreements that run throughout the literature. Much of this information has to do with factors that either inhibit or contribute to successful articulation linkages.

Several authors (Day 1985; King 1988; Palmer 1989; Selman and Wilmoth 1989; and White 1989) identify deterrents to the development of articulation agreements, in other words, factors that hinder articulation from taking place. Deterrents can be classified into the following categories: institutional, individual, and informational. Institutional deterrents are those that have to do with institutional policies and procedures that affect articulation. Some institutional barriers include scheduling, union contracts, lack of administrative support, and lack of resources. Individual barriers are those that are attributable to the individuals responsible for developing and carrying out the articulation arrangements. They include such things as negative attitudes, resistance to change, professional elitism, and "turfism." Informational deterrents are those related to lack of information and/or publicity about articulation arrangements, once they are in place, including poor communication. Boyer (1983) suggests that many of these deterrents are simply smoke screens that conceal an unwillingness to develop articulation agreements.

Fortunately, there is much advice in the literature about factors that encourage the development of articulation agreements at any level and between or among any group of institutions and organizations. According to Harsher and Day (1987), Long et al. (1986), McKinney et al. (1988), and Virginia Department of Education (1988), the following factors influence the planning and implementation of successful articulation arrangements:

- **Leadership.** The leadership for articulation must come not only from local administrators but also from state officials. Leaders must set a high priority for the planning and implementation of articulation agreements.

- **Involvement of Key Personnel.** All the key players should be involved in the planning of articulation arrangements from the beginning. Depending on the organizations and institutions involved, "key personnel" could include faculty, teachers, business and industry representatives, and/or government personnel.

- **Goal Consonance.** Those involved in planning and implementing an articulation arrangement should arrive at consensus on its goals or purpose. Such agreement prevents problems in the implementation stages.

- **Formal Agreements.** Formal agreements that spell out the details of articulation arrangements are very important. Such agreements prevent ambiguities from occurring and facilitate the implementation of the arrangement. They also serve to highlight their importance and can also be used to provide information.

- **Positive Human Relations.** Because articulation agreements must be worked out by individuals, human relations factors are of paramount importance. There must be an atmosphere of mutual trust and confidence, open communication, and recognition that each contributor brings something important to the table.

Articulation is an idea whose time has come. Like all collaborative efforts, it requires staff time, leadership and commitment to make it work, and a willingness to restructure. It will likely mean relinquishing old ways of doing things and may require increased flexibility on the part of cooperating institutions. The benefits of better service to students and the community, however, will far outweigh the costs in staff time and money needed to develop and implement articulation agreements.

REFERENCES

Items with ED numbers may be ordered from the ERIC Document Reproduction Service, CBIS Federal, 7420 Fullerton Road, Suite 110, Springfield, VA 22153-2852, (800) 443-3742, (703) 404-1400.

Alabama Department of Postsecondary Education. ***Dimensions 2000: A Strategic Plan for Building Alabama's Future.*** Montgomery: Alabama Department of Postsecondary Education, 1987. (ERIC Document Reproduction Service No. ED 295 688).

American Council on Education. ***Guide to the Evaluation of Educational Experiences in the Armed Services.*** New York: Macmillan, biennial.

American Council on Education. ***Handbook to the "Guide to the Evaluation of Educational Experiences in the Armed Services."*** Washington, DC: ACE, January 1990.

Ashmore, Catherine M., ed. ***Entrepreneurship and Economic Development: Catalysts for Change. Proceedings of the National Entrepreneurship Education Consortium Conference (Las Vegas, NV, December 3, 1987).*** Columbus: The National Center for Research in Vocational Education, The Ohio State University, 1988. (ERIC Document Reproduction Service No. ED 297 165).

Bender, Louis W., ed. ***Spotlight on the Transfer Function: A National Study of State Policies and Practices.*** Washington, DC: American Association of Community and Junior Colleges, 1990. (ERIC Document Reproduction Service No. ED 317 246).

Boyer, Ernest L. ***High School: A Report on Secondary Education in America.*** New York, NY: Harper and Row, 1983.

Brick, Michael. ***An Analysis of Selected Business and Technology Programs in High Schools and in Two-Year Colleges and Institutes of New York State with a View toward Initiating Articulation Procedures in Counterpart Offerings.*** New York, NY: Center for Urban Education, 1967. (ERIC Document Reproduction Service No. ED 012 791).

Bushnell, David S. ***Cooperation in Vocational Education.*** Washington, DC: American Association of Community and Junior Colleges and the American Vocational Association, 1978. (ERIC Document Reproduction Service No. ED 164 052).

Carnevale, Anthony P.; Gainer, Leila; and Meltzer, Ann. ***Training the Technical Work Force.*** Washington, DC: American Society for Training and Development, 1990. (ERIC Document Reproduction Service No. ED 391 978).

Cohen, Arthur M. *Commitment to Transfer. ERIC Digest.* Los Angeles: ERIC Clearinghouse for Junior Colleges, University of California at Los Angeles, 1989. (ERIC Document Reproduction Service No. ED 310 832).

College Board Review no. 154 (Winter 1989-90).

Day, Philip R., Jr. *In Search of Community College Partnerships. Keeping America Working Series no. 2.* Washington, DC: American Association of Community and Junior Colleges, 1985. (ERIC Document Reproduction Service No. ED 294 616).

Deegan, William L. *Managing Contract Training Programs: Progress and Proposals.* Tallahassee: Institute for Studies in Higher Education, Florida State University, 1988. (ERIC Document Reproduction Service No. ED 294 616).

Deegan, William L., and Drisko, Ronald. "Contract Training: Progress and Policy Issues." *Community and Junior College Journal* 55, no. 6 (March 1985): 14-17. (ERIC No. EJ 317 274).

de los Santos, Alfredo G., Jr. *Changes in Credit Hour Distribution.* Phoenix, AZ: Maricopa County Community College District, 1989. (ERIC Document Reproduction Service No. ED 307 918).

Donovan, Richard A.; Schaier-Peleg, Barbara; and Forer, Bruce, eds. *Transfer: Making It Work. A Community College Report.* Washington, DC: American Association of Community and Junior Colleges, 1987. (ERIC Document Reproduction Service No. ED 281 579).

Gollattscheck, James; McKenney, James F.; and Mahoney, James. *Keeping America Working Project: Industry Training Inventory, 1986.* Washington, DC: American Association of Community and Junior Colleges, 1986. (ERIC Document Reproduction Service No. ED 281 585).

Harsher, Sharon L., and Day, Philip R., Jr. "High Schools and Community Colleges: Teaming up for Cooperative Education." *Journal of Cooperative Education* 23, no. 3 (Spring 1987): 76-86. (ERIC No. EJ 357 633).

Illinois Community College Board. *Economic Development Grant Report, Fiscal Year 1986.* Springfield: Illinois Community College Board, 1986. (ERIC Document Reproduction Service No. ED 275 361).

Jacobs, James. *Training and Public Policy: Final Report.* Ann Arbor, MI: Industrial Technology Institute, 1987. (ERIC Document Reproduction Service No. ED 284 600).

Johnston, William B., and Packer, Arnold. *Workforce 2000: Work and Workers in the 21st Century.* Indianapolis, IN: Hudson Institute, 1987. (ERIC Document Reproduction Service No. ED 290 887).

Joint Economic Committee. *Competitiveness and the Quality of the American Work Force. Parts 1-2.* Washington, DC: Joint Economic Committee, U.S. Congress, 1988. (ERIC Document Reproduction Service Nos. ED 295 013-014).

Kapfer, Mark. "Making the Partnership Work through a Business and Industry Center." Paper presented at the American Association of Community and Junior Colleges Conference, Las Vegas, NV, April 1988. (ERIC Document Reproduction Service No. ED 293 601).

King, Elizabeth C. "Winning Together: Negotiating Transfer Agreements in Allied Health." *New Directions for Community Colleges* no. 61 (Spring 1988): 63-71. (ERIC No. EJ 367 850).

Kintzer, Frederick C. *Articulation and Transfer: A Review of Current Literature on Statewide and Interinstitutional Program Models and Trends.* Trenton: New Jersey Department of Higher Education, 1989. (ERIC Document Reproduction Service No. ED 311 946).

LeBlanc, Carol. *Arizona Perspectives on Vocational Education, 1984-1989. 1987 Update.* Phoenix: Arizona Board of Directors for Community Colleges, 1987. (ERIC Document Reproduction Service No. ED 282 589).

Lerner, Max J. *Articulation between For-Profit Private Occupational Schools and Secondary Vocational Programs/Colleges and Universities. Information Series no. 315.* Columbus: The National Center for Research in Vocational Education, The Ohio State University, 1987. (ERIC Document Reproduction Service No. ED 284 063).

Lieberman, Janet E. *Middle College: A Ten Year Study.* Long Island City, NY: LaGuardia Community College, 1986. (ERIC Document Reproduction Service No. ED 271 153).

Long, James P.; Warmbrod, Catharine P.; Faddis, Constance R; and Lerner, Max J. *Avenues for Articulation: Coordinating Secondary and Postsecondary Programs. Research and Development Series no. 259.* Columbus: The National Center for Research in Vocational Education, The Ohio State University, 1986. (ERIC Document Reproduction Service No. ED 264 445).

McKinney, Floyd L.; Fields, Ernest L.; Kurth, Paula E.; and Kelly, Freeman E. *Factors Influencing the Success of Secondary/Postsecondary Vocational-Technical Education Articulation Programs.* Columbus: The National Center for Research in Vocational Education, The Ohio State University, 1988. (ERIC Document Reproduction Service No. ED 289 053).

McNett, Ian. *The Development Triangle: Community College Assistance for Economic Growth.* Washington, DC: Center for Regional Policy Study, Northeast-Midwest Institute, 1986. (ERIC Document Reproduction Service No. ED 289 528).

MDC, Inc. *The Bridge to the Next Century: A Commentary by the National Advisory Panel.* Chapel Hill, NC: MDC, Inc., 1988. (ERIC Document Reproduction Service No. ED 298 971).

Medsker, Leland J. *The Junior College*. New York, NY: McGraw-Hill, 1960.

Miller, Juliet V., and Imel, Susan. *Some Current Issues in Adult, Career, and Vocational Education*. Columbus: ERIC Clearinghouse on Adult, Career, and Vocational Education, The National Center for Research in Vocational Education, The Ohio State University, 1987. (ERIC Document Reproduction Service No. ED 281 899).

National Advisory Council on Vocational Education. *Articulation: A Study by the National Advisory Council on Vocational Education*. Washington, DC: 1976. (ERIC Document Reproduction Service No. ED 133 434).

New Mexico Association of Community, Junior, and Technical Colleges. *The New Mexico Association of Community, Junior, and Technical Colleges Position Paper on the Important Issues Facing New Mexico's Two-Year Colleges*. Santa Fe, NM: 1987. (ERIC Document Reproduction Service No. ED 288 581).

New York State Education Department. *Education: Key to Economic Growth*. Albany: New York State Education Department, 1986. (ERIC Document Reproduction Service No. ED 273 016).

North Carolina Department of Community Colleges. *Planning for Our Future*. Raleigh, NC: 1988. (ERIC Document Reproduction Service No. ED 316 306).

Opachinch, Cheryl A., and Linksz, James J. *A Handbook for Articulating High School and Community College Career Programs*. Catonsville, MD: Catonsville Community College, 1974. (ERIC Document Reproduction Service No. ED 104 455).

Palmer, J. C. "Articulation between Degree Programs." In *Problems Faced by Military Personnel in Pursuing Higher Education Programs: A Study with Recommendations*, by D. W. Stewart, M. J. Ludwig, J. C. Palmer, and W. E. Becraft. Washington, DC: American Association of Collegiate Registrars and Admissions Officers; American Association of Community and Junior Colleges; American Association of State Colleges and Universities; and American Council on Education, November 1989. (ERIC Document Reproduction Service No. ED 314 603).

Parnell, Dale. *The Neglected Majority*. Washington, DC: American Association of Community and Junior Colleges, 1985. (ERIC Document Reproduction Service No. ED 262 843).

Parnell, Dale. *Dateline 2000: The New Higher Education Agenda*. Washington, DC: American Association of Community and Junior Colleges, 1990. (ERIC Document Reproduction Service No. ED 316 270).

Perry, Nancy. "Corporate America: A New Partner for the Public Schools." *College Board Review* no. 154 (Winter 1989-90): 6-9, 21-23. (ERIC No. EJ 405 549).

Pincus, Fred L., and Archer, Elayne. *Bridges to Opportunity: Are Community Colleges Meeting the Transfer Needs of Minority Students*? Washington, DC: Academy for

Educational Development; New York, NY: College Entrance Examination Board, 1989. (ERIC Document Reproduction Service No. ED 312 026).

Prager, Carolyn, ed. *Enhancing Articulation and Transfer. New Directions for Community Colleges no. 61.* Los Angeles: ERIC Clearinghouse for Junior Colleges, University of California-Los Angeles, 1988. (ERIC Document Reproduction Service No. ED 291 451).

Richter, Winston Boos, Jr., and Wahl, John C., eds. *Economic Development and the American Community College.* Gainesville: Institute of Higher Education, University of Florida, 1987. (ERIC Document Reproduction Service No. ED 290 506).

Robertson-Smith, Mary. "Accreditation and Articulation of Business Programs." *New Directions for Community Colleges* no. 61 (Spring 1988): 57-62. (ERIC No. EJ 367 849).

Selman, J. W., and Wilmoth, J. W. "Articulation Practices and Problems Perceived by Vocational Personnel in Selected Secondary and Postsecondary Institutions." *Journal of Studies in Technical Careers* 11, no. 1 (Winter 1989): 25-37. (ERIC No. EJ 390 178).

Shenker, Joseph; Smith, Joshua L.; de los Santos, Alfredo G., Jr.; Hodgkinson, Harold L.; Richardson, Richard C.; and Wolfman, Brunetta Reid. *Building Partnerships: The Opportunities Ahead.* Trenton: New Jersey Department of Higher Education, 1987. (ERIC Document Reproduction Service No. ED 281 599).

Smith, Thomas J., and Trist, Carolyn. *Training and Educating the Work Force in the Nineties: The Rationale for Public/Private Collaboration. Information Series no. 331.* Columbus: ERIC Clearinghouse on Adult, Career, and Vocational Education, The National Center for Research in Vocational Education, The Ohio State University, 1988. (ERIC Document Reproduction Service No. ED 303 679).

Thomas, Gary. "Transfer Relationships between Two-Year and Four-Year Technological Programs." *New Directions for Community Colleges* no. 61 (Spring 1988): 49-55. (ERIC No. EJ 367 848).

Virginia Department of Education. *Articulation in Virginia: Coordination of Secondary/Postsecondary Education.* Richmond: Virginia Department of Education, 1988.

White, Barbara. *Planning for Articulation: 2+2 Vocational Education Programs.* Honolulu: Office of the State Director for Vocational Education, University of Hawaii, April 1989. (ERIC Document Reproduction Service No. ED 311 193).

White, Martha C. *The 1988-89 Job Outlook in Brief.* Washington, DC: Bureau of Labor Statistics, U.S. Department of Labor, 1988. (ERIC Document Reproduction Service No. ED 306 418).

Whitlock, B. W. ***Don't Hold Them Back: A Critique and Guide to New High School-College Articulation Models***. New York, NY: College Entrance Examination Board, 1978. (ERIC Document Reproduction Service No. ED 157 414).

Woodbury, Kenneth B., Jr. "Articulation and Dual Admissions." ***New Directions for Community Colleges*** no. 61 (Spring 1988): 7-15. (ERIC No. EJ 367 844).

THE 1990 ERIC INFORMATION ANALYSIS PAPERS

IN 342 $8.75

Family and Intergenerational Literacy Programs: An Update of "The Noises of Literacy," by Ruth S. Nickse.

Family and intergenerational literacy programs represent one promising approach to the problem of illiteracy, combining the agendas of adult basic skills improvement and children's literacy development. Nickse depicts the context of family/intergenerational literacy, examines an interdisciplinary research base, and describes existing programs. A typology of four generic program models with their advantages and disadvantages is developed, and 12 programs classified using the typology are detailed.

IN 343 $5.25

Articulation Models for Vocational Education, by Mary Robertson-Smith.

The vital role of articulation in vocational education today is highlighted in this review of the process of coordinating curricula at different levels of education. Types of interschool articulation examined are tech-prep, cooperative education, proprietary schools, retention of at-risk students, and college-to-college arrangements. Nonschool partnerships reviewed include those with business and industry, government agencies, and the military.

IN 344 $4.75

A Framework for Evaluating Local Vocational Education Programs, by N. L. McCaslin.

Increased emphasis on evaluation in educational reform movements necessitates a comprehensive, systematic approach to assessment. The framework for vocational education evaluation presented in this paper draws information from the needs for vocational education of students, employers, and society; from program processes; and from program outcomes. Steps for implementing the evaluation framework in local programs are outlined.

IN 345 $10.50

Competency-Based Career Development Strategies and the National Career Development Guidelines, by Howard Splete and Amy Stewart.

Splete and Stewart give an overview of the National Career Development Guidelines, which they use as a basis for analyzing over 1,500 ERIC abstracts. The abstracts are coded by National Guidelines areas and competencies as well as educational level (elementary, middle/junior high, high school, 2-year community college, 4-year college/university, business/industry, and community agency). Sample career development activities related to the National Guidelines are provided for each level, with recommendations on using the competencies for the growth and revitalization of career development programs.

ORDERING INSTRUCTIONS

To order additional copies, please use order number and title. Orders of $10.00 or less should be prepaid. Make remittance payable to the Center on Education and Training for Employment. Mail order to:

Center on Education and Training for Employment
Center Publications
1900 Kenny Road
Columbus, OH 43210-1090

Prices listed are in effect at the time of publication of this book. All prices include postage and handling. Prices are subject to change without notice.

Quantity Discounts
Orders of five (5) or more items, as listed by publication number and title, with a total dollar value for the order of:

$ 50 to $100, the discount is 5%
$101 to $200, the discount is 10%
$201 to $300, the discount is 15%
$301 to $400, the discount is 20%
$401 and above, the discount is 25%

International Orders
All orders, in any amount, from outside the United States and its possessions are to be paid in U.S. currency. Additional postage and handling charges may be added for foreign shipments if necessary.